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09/940,494	08/29/2001	Robert Michael Stewart	817LR/50045	5239

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EXAMINER

BERMAN, SUSAN W

ART UNIT

PAPER NUMBER

1711

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10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,494

Applicant(s)

STEWART ET AL.

Examiner

Susan W B rman

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 9-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 7,8 is/are objected to.
- 8) ☒ Claim(s) 1-22 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Election/Restriction

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-8, drawn to a process for continuous coagulation and drying of a rubber latex by microwave energy and hot air, classified in class 522, subclass 86.
- II. Claims 9-22, drawn to an apparatus comprising a coagulator, a heater to provide microwave energy and hot air, and a dryer, classified in class 219, subclass 678.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the claims of Group I do not require a means such as a conveyor belt for passing a stream of latex through a coagulator, a single heater that provides a combination of microwave energy and hot air or a plurality of conveyor belts arranged so that coagulated rubber is passed from one belt to another.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, separate status in the art because of their recognized divergent subject matter, and because the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Kening Li, Registration No. 44872, on June 9, 2003, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-8. Affirmation of this election must be made by applicant in responding to this Office action. Claim withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Art Unit: 1711

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

Drawings

The drawings are objected to because of copy machine marks and because the margins to top, bottom, left and right are not acceptable, words do not appear on a horizontal, left-to-right fashion when the page is upright, the number "2" and its description are missing and the words "Figure 1" are incomplete. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. See 37 CFR 1.84 or 1.152.

Claim Rejections - 35 USC § 102/35 USC § 103 Claim Rejections -

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as obvious over Hawkes, Jr. (4,499,036) in view of Forster et al (3,771,234). Hawkes, Jr. discloses a process comprising transporting a fluid latex on a conveyor belt into a conventional preheated hot air oven to cause gelling, foaming and water removal followed by exposure to microwave radiation to effect curing or the process practiced by employing an oven having both conventional and microwave heating capabilities. See column 3, lines 58-68, column 4, lines 1-11 and lines 40-68, column 5, lines 48-66, column 6, lines 13-46, and the Examples. The disclosed process of heating the rubber latex at temperatures 160 to 180 °F in the presence of a gelling agent would be expected to cause coagulation because the heating process and temperatures correspond to the process and temperatures instantly disclosed (see page 5 of the instant specification and column 3, lines 30-41).

Forster et al disclose a microwave drying process for synthetic polymers, such as butyl rubber. The drying process is by a pneumatic conveyor resonating cavity wherein a first resonating cavity operates at a microwave frequency of about 600 to about 50,000 MHZ and a second resonating cavity operates at a microwave frequency of 2,450 MHZ. See column 7, lines 5-43, and Example 1. Forster et al teach that the volatile content of nonpolar materials can be reduced to below the detectable limit of 1 ppm by continuous drying using microwave heating while conveying the material to be dried in a pneumatic conveyor (column 3, lines 35-40). Forster et al teach that the drying technique disclosed is suitable for any latex polymerization process (column 5, lines 51-59, and column 6, lines 25-28). The difference from the instantly claimed process is that Forster et al do not teach heating the latex stream in a coagulator by a combination of microwave energy and hot air before drying.

It would have been obvious to one skilled in the art at the time of the invention to employ the embodiment of the process disclosed by Hawkes, Jr., wherein the process employs an oven having both conventional and microwave heating capabilities and a temperature that would cause coagulation of the rubber latex and drying of the latex. Hawkes, Jr. provides motivation by teaching this alternative. Hawkes, Jr. also teaches that an undetermined amount of cooling occurs when the latex is heated in a hot

Art Unit: 1711

air oven and then removed and placed in a microwave oven, thus providing motivation to employ a combination oven to avoid cooling between ovens. It would further have been obvious to one skilled in the art at the time of the invention to employ a second microwave oven in the process disclosed by Hawkes, Jr. to further reduce the volatile content of the product of the latex polymerization process, as taught by Forster et al. Forster et al provide motivation by teaching a process for drying synthetic polymers, such as butyl rubber, using two microwave ovens and different microwave frequencies in order to further reduce the volatile content of the product of a latex polymerization process. With respect to claim 3, It would have been obvious to one skilled in the art at the time of the invention to determine the optimum thickness of the latex being transported on the conveyor belt into an oven.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as obvious over Argy et al (6,346,557, having an effective filing date of 04-12-2000) in view of Giiurak et al (4,303,569) or Hawkes, Jr.. Argy et al disclose a process for coagulation of a cellulose-fibre/rubber latex in a microwave tunnel or a hot-air oven followed by heating to dry and crosslink in a microwave oven or hot air oven, among other heating devices. Argy et al teach that it is advantageous to carry out coagulation and drying and crosslinking in a single step in a single heating device. See column 6, line 37, to column 7, line 57, and the Examples, especially Example 7 wherein a forced-air oven is used to coagulate the foam and to dry the coagulation product and crosslink the latex. Argy et al teach that a microwave or hot-air oven is equivalent to the forced-air oven employed in the process of Example 7. Argy et al teach collecting a foam in a beaker and pouring it into a mould to a depth of about 6 cm which is placed in the oven. Argy et al do not teach passing a stream of the latex through a coagulator, introducing the coagulated rubber stream into a dryer or passing the coagulated rubber stream through the dryer.

Giiurak et al disclose a process for coagulation of a latex in a tubular coagulation means and passing the coagulated mixture to a conduit equipped with an impingement plate and then to a means for

Art Unit: 1711

separation, recovery and drying. It would have been obvious to one skilled in the art at the time of the invention to employ a coagulant stream in a tubular coagulation means, as taught by Giiurak et al, instead of a mould to introduce the foam into the oven in the process disclosed by Argy et al. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of success because the coagulation, drying and crosslinking steps disclosed by Argy et al would have been expected to be successful whether the sample was in a mould, as taught by Argy et al in the Examples, or in a tubular coagulation means, as taught by Giiuraak et al. With respect to claim 3, It would have been obvious to one skilled in the art at the time of the invention to determine the optimum thickness of the latex being transported on the conveyor belt into an oven.

Alternatively, it would have been obvious to one skilled in the art at the time of the invention to employ the method of transporting a fluid latex on a conveyor belt into a hot-air oven and/or a microwave oven taught by Hawkes, Jr. in the process disclosed by Argy et al. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of success because the coagulation, drying and crosslinking steps disclosed by Argy et al would have been expected to be successful whether the sample was in a mould, as taught by Argy et al in the Examples, or in the form of a fluid latex on a conveyor belt, as taught by Hawkes, Jr.. With respect to claim 3, It would have been obvious to one skilled in the art at the time of the invention to determine the optimum thickness of the latex being transported on the conveyor belt into an oven.

Claim 6 is rejected under 35 U.S.C. 103(a) as obvious over Hawkes, Jr. (4,499,036) in view of Forster et al (3,771,234), as applied to claims 1-3 and 5 above, and further in view of Collins et al (4,566,804). Collins et al disclose processes for controllable heating and drying of materials by microwave radiation employing computerized controls. It would have been obvious to one skilled in the art at the time of the invention to employ computer controls to regulate the latex conveyor speeds, the

Art Unit: 1711

temperature in the oven(s) and/or the microwave energy employed in the process disclosed by Hawkes, Jr. in view of Forster et al, as taught by Collins et al.

Claim 6 is rejected under 35 U.S.C. 103(a) as obvious over Argy et al (6,346,557, having an effective filing date of 04-12-2000) in view of Giiurak et al or Hawkes, Jr. (4,499,036), as applied to claims 1-5 above, and further in view of Collins et al (4,566,804). Collins et al teach that it is known in the art to employ computerized controls for controllable heating and drying of materials by microwave radiation. It would have been obvious to one skilled in the art at the time of the invention to employ computerized controls to regulate the latex conveyor speeds, the temperature in the oven(s) and/or the microwave energy employed in the process disclosed by Argy et al in view of Hawkes, Jr., as taught by Collins et al.

Allowable Subject Matter

Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The cited prior art does not mention or suggest stretching a coagulated rubber stream or increasing the speed of conveyance from a coagulator to a dryer.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lee et al (4,391,765). Lee et al disclose a method for making a microwave cured silicone elastomeric foam. A stable froth of an aqueous emulsion is prepared by mixing air into an emulsion and is exposed to microwave energy to remove water. See column 3, lines 4-8, column 3, line 56, to column 4, line 22, column 7, lines 62-65, column 8, lines 3-11, and the Example.

Art Unit: 1711

EP 1 184 148 A2 is a European patent disclosing the same subject matter as instantly claimed by the same inventors and citing the same priority document.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W Berman whose telephone number is 703 308 0040. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 703 308 2462. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9310 for regular communications and 703 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.



Susan W Berman
Primary Examiner
Art Unit 1711

SB
June 14, 2003